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AUTHOR Grapko, Michael P.
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ABSTRACT

The project attempted to discern the possible resulting effects on children and teachers from major structural changes in the design of classroom space. Three assumptions were tested: (1) children will assume greater initiative in resource use, (2) teachers get to know the children better, and (3) team teaching in open space classrooms contributes to better academic success. For this study, two schools were selected that resemble each other in a number of variables to minimize effects from socioeconomic, racial, or ethnic differences; mobility of families; or length of membership in the community. Study data were collected through (1) a Child Study Security Test, administered to all subject children on two occasions; (2) a teacher rating questionnaire and a correlation matrix; (3) scores on four subtests of the Canadian Test of Basic Skills; and (4) student I.Q. scores. The findings indicate, in part, that while a general improvement was shown in security, consistency, and independence scores for some students, each grade level in both schools showed a constancy or stability for each of the three security measures; the belief that students in open space classrooms increase in developing their feelings of self-confidence, work habits, and desire to work independently was not supported; teachers working in open space classrooms show some slight advantage over teachers in traditional classrooms in their ability to rate students in accordance with children's self description on a personality test; and that, based on tests of grade six students, students in traditional classrooms do better academically. (Author/MLF)

Final Report

A Comparison of Open Space and Traditional Classroom Structures According to Independence Measures in Children, Teachers' Awareness of Children's Personality Variables, and Children's Academic Progress

- Michael F. Grapko,
Principal Investigator.

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A Comparison of Open Space and Traditional Classroom Structures According to Independence Measures in Children, Teachers' Awareness of Children's Personality Variables, and Children's Academic Progress.

A. Purpose and Background

The project is primarily concerned to discern the effects on children and teachers which may result from major structural changes in the design of classroom space. Suggested in the open space classrooms are a number of assumptions which have yet to be tested. The use of open space by children has some implicit notion that the child will assume greater initiative in the use of greater resources available to him and grow in independence. Additionally, there may be a suggestion that teachers in open space classrooms have greater visible contact with children, see the children more frequently and in more varied situations, which permits the opportunity to know the children better. A third suggestion associated with open space classrooms implies that team teaching would contribute to better academic progress for the children.

The study is designed to seek some support for these assumptions, or conversely to question their validity. The rapid growth in schools with open space has exceeded the supply of data necessary to check out the educational values of these structures. The present study intends to provide some data that will examine children's personality and academic development in comparing the effects of the traditional classrooms and open space classrooms as well as examine differences in teacher awareness in these two school structures.

Previous studies have shown that wide individual differences exist among teachers in their ability to rate children to agree with children's self description on a personality test. (Grapko, 1970; Grapko and Fraser, 1971). Agreement between teachers' ratings of children and children's self report on a personality test is used as a measure of teacher awareness. Results show that teachers who achieve high awareness scores are inclined to report a greater interest in the "total child" and also express a preference for more participatory behaviour by the children in the educational process leading to

more group project work, more classroom discussion and greater individual freedom for the children in the pursuit of their own school studies.

The open space schools represent a significant departure from the traditional school structures. Instead of self-contained walled classrooms, the open space school is composed of instructional areas without internal walls which form a border around a resource centre. The number of instructional areas vary considerably from school to school, and in some open space structures, the instructional areas may be grouped into sections or pods permitting open space classrooms according to certain grade groupings. These sections or pods may be separated by walls from each other with a centrally located resource area available directly from each pod.

The open space school selected in the present study was designed as a total open plan structure. The open area accommodates the entire pupil population of the school with several instructional areas located within a single open space. The instructional area is flanked by a separate facility which serves as a gymnasium, lunch area and auditorium. A few separate rooms are included in the overall structure providing office space, staff rooms and special educational classrooms.

The large number of open space schools developed in the last few years, particularly in Ontario and British Columbia, identifies a firm commitment to these schools as providing a better environment for teaching and learning for teachers and pupils. It is believed that teachers are no longer organizationally isolated in open space classrooms and additionally increase their opportunity for team teaching and cooperative planning. The greater flexibility of open space is perceived as stimulating and challenging and brings a new vitality to the educational setting.

The critics of open space schools generally describe the increased visual and acoustical contact as creating a chaotic environment full of distractions and conducive to conflict between teachers and pupils. It is also proposed that instruction is less formalized and children fail to learn the basic academic skills. It is further argued that the freedom of open space and the increased movement of children promotes an unstructured atmosphere that reduces purposeful learning.

In a Metropolitan Toronto Board of Education report on the Study of Educational Facilities (1973), a comparative analysis is made between open space and traditional schools. The single factor to which critical importance is assigned

in comparing the two settings is staff relations. Personnel at every open space school visited mentioned it among the first subjects discussed. The absence of walls means that the teachers are forced to have more contact with each other and with students than in a traditional plan school. Brunetti, Cohen, Meyer and Molnar (1972) identify two major differences between open space and traditional schools. They suggest that in the open space schools teachers operate as a formal work team to make important decisions about groups of children, scheduling, curriculum, and learning problems. Secondly, teachers have both visual and acoustical contact with each other as they work. In general, open space schools require a much more complex structure or organizational relationship reflecting greater interaction, more complex communication problems and the demand for more regular and sustained evaluation of school objectives.

While there is a growing body of research that has helped provide a better understanding of the nature and value of the open space school, there is as yet no conclusive evidence to support unequivocally the claims made by proponents or critics. A review and analysis of over 50 Canadian and American studies of open space schools has revealed that most research efforts are exploratory in nature and do not show consistent correlational or causal relationships between space and attitudinal or behavioral outcomes (Brunetti, et al, 1972). The information service of the Ontario Institute for Studies in Education prepared a bibliography which includes 83 references which are divided according to two broad headings, including (1) teaching in an open plan school and (2) facilities. Twenty-six of these references deal with journal articles, of which sixteen describe the teaching strategies appropriate to open plan schools. A few of the articles refer to learning opportunities for students in open plan, while only four references comment on student performance and behavior.

Hockey (1969) speculated on the effects of innovation on students and teachers without presenting any factual data. McNutt (1969) stresses the effect of open plan by emphasizing the increase in student freedom and responsibility. The Overlander Elementary School in Kamloops (1970) reports that an evaluation at the end of the first year of an open area school indicates that good progress was made in judging the child's progress in terms of his individual ability. Anderson (1970) believes that open plan is best for primary and senior high school students and argues in favour of closed classrooms for pupils in the grade 7 and grade 8 level. Stolee (1970) who

reports on the Edmonton Public School system refers to open space schools as educational bazaars or bargain days at Woolco.

MacDonald (1969) in speaking at the Canadian Education Association about "the new school" stresses among other things the importance of independent study and individualized instruction. Burnham (1970) attempts to describe what it is like to be a pupil in an open plan school and speaks of pupil initiative, responsibility, cooperation, inquiry, security and acceptability of the open plan arrangement. In an article on Open Education, Burnham (1971) examines a number of basic questions which deal with pupil performance and teacher and pupil attitudes. A team of principals were involved in collecting observational data during a one-day visit to an open space and traditional school. The findings of this study report that pupils in open space classrooms express greater initiative reflecting the child's personal interests, a more successful use of opportunity to plan school activities, and a better ability to raise pertinent questions. The teachers in open space classrooms are observed to plan more cooperatively. It is interesting to note also that the principals reported their preference for attending an open space school if they were a pupil. In a related study, Burnham (1971) compared I.Q. and achievement tests scores between open space and traditional schools for grade 1 children. No significant differences were found between the two types of schools.

Wilson, Langevin and Stuckey (1969) compared pupils in two open plan schools, one in which students had spent all of their six school years, and one which had just opened, with pupils in fifth and sixth grades from traditional schools. Both open plan schools were nongraded, used a discovery approach to learning, and followed programs of self-development and self-discipline. Each student was expected to plan his own day, to do things for himself, and to interact with the teacher as a resource person rather than an authority. Raising hands to ask questions was discouraged and pupils were expected simply to speak in turn. They were also expected to exercise responsibility in their use of materials and to turn up at school on their own. The control group consisted of two traditional classrooms from two different schools where school subjects were studied through instruction and exercise, discovery learning was not used, and most activities were teacher directed. The results of this study indicate that pupils in open space schools have better attitudes toward school, have a better self-image, express a greater interest in books, however ranked somewhat lower on creativity measures. No significant differences were found between pupils in open space and traditional

classrooms on two curiosity questionnaires.[1]

Brunetti et al (1972) collected questionnaire data from 110 teachers in nine open space schools and 120 teachers in eight self-contained classroom schools. Moreover, all open space schools formally emphasized team teaching while none of the traditional schools did so. The results of the analysis of these data indicate that teachers in open space classrooms (also involved in team teaching) express greater teacher influence, autonomy, teacher interaction and job satisfaction than teachers in traditional classrooms.

While the research on open space schools is scanty, there is a clear impression that most of it has been designed to prove the value of open space instruction. In many cases, the studies accentuate results which favor open space schools and question or express some doubt about the validity of findings which support traditional schools. The final outcome may show that classroom structures per se have little real effect on the behavior and accademic performance of children or on the attitude and effectiveness of the teacher. However, it is recognized that there has been a major commitment by most Boards of Education in Ontario to build open space schools. The reasons for this decision are neither clear nor unanimous. In many cases it is difficult to identify who is responsible for the thrust behind the decision to build open space schools. While these schools look attractive, expansive and impressive, the justification for this type of school architecture appears to be part of the general surge for innovation in education with the implicit assumption that if it is different and daring it must be better.

The present study is not designed to support open space schools, nor do the results attempt to reflect a bias in favor of either open space or traditional classrooms. The study does attempt to be objective and to recognize that more research data is necessary for a full and proper evaluation.

B. Method and Analysis

a) Selection of Schools

Two schools situated in the town of Meaford in Grey County were selected for the study. The Meaford Elementary School (ME) is a K to 8 school which has served the town for about twenty-eight years. In 1970 a second elementary

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1. It is unfortunate that a comparison of open space and traditional classrooms should be confounded with major differences in teaching styles and teacher intervention.

school (SVE) was built (open space) to serve an overflow of town children and the rural children who were being bussed in, resulting from the regional reorganization of school boards. About 60% of the children attending the open space school come from the rural areas and are transported to school. The SVE school is K-6. The two schools are located on the west and east part of town.

b) Composition of Samples

All children attending grades 4 to 7 were selected in the ME school for purposes of the present study. Included in the sample are 77 girls and 70 boys in the grade 4 to 6 range and 59 girls and 51 boys in the four grade 7 classes. A total of 257 children are included from the ME (traditional classrooms) school.

In the SVE school (open space classrooms) a total of 244 children attended grades 4 to 6, 112 girls and 132 boys. There were three grade 4 and 5 classes and two grade 6 classes in the SVE school. All 244 children areincluded in the study.

c) Data Collection

The Institute of Child Study Security Test - Elementary Form, called "The Story of Jimmy", was administered to all children in the study in the second week of January, 1972. The test is a group test and was administered to each classroom by the principal or vice-principal of the school.

The test is designed to elicit an order of preference for various behavioral responses to each of fifteen situations described in story form and terminating with five choices of action. The child is asked to rank the five choices from 1 to 5. Two composite scores are provided by the test, namely security and consistency. The security score measures the child's confidence in his ability to accept consequences for his own decisions. The consistency score identifies the similarity of response pattern the child is likely to select over fifteen situations. This score also measures the child's organizational ability and good work habits.

Five component scores are also provided by the test, namely independence (IS), peer dependence (MDS), dependence on adults (IDS), avoidance mechanisms (DA) and anxiety (INS). The situations in the story sample activities which deal with adult-child relationships, peer relationships, school performance and leisure time. A copy of the test is included in Appendix 1.

During the second week of January, 1972 each classroom teacher completed a pupil behavior rating scale for all children in his or her class. Since the grade 7 classes attending the ME school were on a rotary system, eight teachers rated one or more classes. Two teachers rated all the pupils in the four grade 7 classes. The Teachers' Rating Questionnaire consisted of sixteen items designed to assess performance and behavioral characteristics. Each item in the questionnaire is rated on a five point scale. A copy of the items are shown in Appendix 2. The teachers required approximately one to three hours to complete the questionnaire. The Canadian Test of Basic Skills (CTBS) was administered during the school year and was part of the regular testing program initiated by the Board of Education.

Four subtests were selected for administration including vocabulary, reading comprehension, mathematics concepts and mathematics problem solving. The administration time for the four subtests requires 132 minutes of actual working time. The mathematics concept is presented to the pupil as a test of how well they understand the number system and the terms and operations used in mathematics. The mathematics problem solving is presented as a test of skill in solving mathematics problems.

During the second week in June, 1972, the Institute of Child Study Security Test was re-administered to all children in the study. In the five month interval there was an overall attrition of 12 cases reducing the total sample from 501 to 489 children. Also during this period, classroom teachers completed the pupil behavior rating scale for a second time. The CTBS was available for all pupils attending grades 4 to 7 at the ME school, however it was administered to only the grade 6 pupils attending the SVE school. Intelligence testscores were available for almost all children in the study but there was no I.Q. testing associated with this project.

d) Analyses of data

The Institute of Child Study Security Test provides five component scores including an independence score and two composite scores, security and consistency. The teacher rating scale included sixteen performance and behavior traits which were distributed on a five point scale. Additionally a total rating was obtained as a summation of all sixteen traits. A correlational matrix was set up showing the degree of relationship between each trait on the rating scale and each of the seven scores on the security test. Statistical significance was determined for each correlation in each cell, and the total

number of statistically significant coefficients was used as an index of teacher awareness.

A similar analysis was completed for both the January and June administrations involving the security test scores and the teachers' ratings. Baseline measures as obtained in January for the variables included in the study are compared to measures obtained in June. A t-test was calculated to show any changes which may have occurred between the period January to June according to whether the children attended the traditional classroom or open space school.

Four subtests of the CTBS were administered including vocabulary, reading comprehension, mathematical concepts and mathematical problem solving. A correlational matrix was prepared showing the relation of achievement scores to I.Q., to security measures and to teacher rating scores for each school independently. Unfortunately no baseline measures were available for the CTBS to permit a comparison of change in achievement scores for traditional and open space classrooms.

C. Results and Discussion

A significant difference between means was calculated between the January and June data for security, consistency and independence scores obtained for the Institute of Child Study Security Test for the ME and SVE schools separately (See table 1). The results of this analysis are also shown between schools for the January and June administrations (See table 3).

The ME school (traditional classrooms) showed no significant differences in any of the three security measures when the January and June results were compared. Means and t scores are shown in Table 1. This analysis was carried out for grades 4 to 6 separately, and no differences were shown for any of the three grades. Accordingly, the results indicate that no statistically significant classroom change occurred in the security behavior of children attending the ME school over the five months period. (Table 1 next page)

Table 1

A comparison of mean scores for security, consistency and independence obtained during January and June for grades 4 to 6 children attending traditional and open space classrooms.

	N	January	June	t	Significance
Grade 4 (traditional classrooms)					
Security	37	69.12	67.87	0.42	NS
Consistency		26.79	28.55	0.36	NS
Independence		32.57	34.06	0.85	NS
Grade 5					
Security	47	62.95	67.52	1.58	.119
Consistency		21.30	26.57	1.23	NS
Independence		37.79	34.71	1.56	.124
Grade 6					
Security	47	77.64	78.70	0.53	NS
Consistency		44.36	45.76	0.37	NS
Independence		27.98	27.29	0.53	NS
Grade 4 (open space classrooms)					
Security	78	60.27	62.67	1.21	NS
Consistency		14.01	20.47	2.75	.007
Independence		39.28	37.22	1.54	.127
Grade 5					
Security	97	65.50	66.79	0.57	NS
Consistency		26.00	29.00	1.03	NS
Independence		35.54	33.86	1.20	NS
Grade 6					
Security	69	66.56	71.08	1.62	.108
Consistency		29.82	30.83	0.30	NS
Independence		34.65	31.47	1.84	.069

A comparison of security measures for the January and June administrations for the SVE school (open space) showed some significant differences. These results are also reported in Table 1. At the grade 4 level, the children showed a significant improvement in consistency (.01 level)[1]. Increase in independence for grade 6 children attending the SVE school approaches statistical significance (.07).

Stability coefficients were calculated for each grade separately, for both schools and these results are shown in Table 2. These coefficients show a high degree of stability among children within groups as well as for groups over time. The security, consistency and independence scores obtain stability coefficients which range from .67 to .94, .58 to .86, and .56 to .78 for the

1. Parenthetically, it is noted that the grade 4 children reported less dependence on adults during the five month period (.02 level).

five classrooms in the ME school (grades 4 to 6) and stability scores which range from .61 to .94, .58 to .90, and .53 to .89 for the eight classrooms in the SVE school (grades 4 to 6). Except for one grade 7 class, the grade 7 children show a similar degree of stability in security behavior to that reported for grades 4 to 6. The means for stability coefficients for the two schools (grades 4 to 6) for the security measures mentioned above are remarkably similar, namely .79 and .80 for security, .76 and .78 for consistency, and .70 and .72 for independence.

Table 2

Stability Coefficients for security, consistency and independence obtained for seventeen classrooms, grades 4 to 7 on the Institute of Child Study Security Test during a five month interval, January to June, 1972.

ME School	N	Security	Consistency	Independence
Grade 3 & 4	24	.76	.73	.71
Grade 4	28	.72	.80	.66
Grade 5	31	.88	.84	.81
Grade 5 & 6	29	.67	.58	.56
Grade 6	33	.94	.86	.78
Grade 7	24	.84	.83	.79
Grade 7	27	.36	.65	.37
Grade 7	30	.62	.79	.68
Grade 7	26	.86	.75	.88
SVE School				
Grade 4	27	.70	.83	.53
Grade 4	24	.85	.81	.88
Grade 4	25	.61	.58	.54
Grade 5	31	.63	.72	.58
Grade 5	31	.94	.85	.82
Grade 5	31	.87	.90	.71
Grade 6	34	.83	.76	.79
Grade 6	32	.93	.80	.89

These two sets of results (i.e. t-tests and stability coefficients) indicate that children maintain their own position over a five month period relative to other children within the classroom in security, consistency and independence, and also the group of children in each classroom show no significant change as a class in a five month period in respect to the three security measures considered in this study.

A comparison of the January data for the ME and SVE schools is shown in Table 3 for security, consistency and independence for each grade separately. The table also shows the same results obtained for the June data. (Table 3, next page, 11a.)

The January results (baseline data) show that pupils attending the open space school (SVE) reveal significantly lower scores on security, consistency

Table 3

A comparison of mean scores for security, consistency and independence for grades 4 to 6 between traditional (ME) and open space (SVE) classrooms according to scores obtained in January and June, 1972:

JANUARY DATA

	Means		t	Significance
Grade 4	ME (37)	SVE (78)		
Security	69.12	60.27	4.02	.001
Consistency	26.79	14.01	4.58	.001
Independence	32.57	39.28	4.76	.001
Grade 5	ME (47)	SVE (97)		
Security	62.95	65.50	0.98	.330
Consistency	21.30	26.00	1.40	.165
Independence	37.79	35.54	1.37	.173
Grade 6	ME (47)	SVE (69)		
Security	77.64	66.56	3.89	.001
Consistency	44.36	29.82	4.08	.001
Independence	27.98	34.65	3.68	.001

J U N E DATA

Grade 4	ME (37)	SVE (78)		
Security	67.78	62.67	1.82	.072
Consistency	28.55	20.47	2.04	.045
Independence	34.06	37.22	1.66	.101
Grade 5	ME (47)	SVE (97)		
Security	67.52	66.79	0.26	NS
Consistency	26.57	29.00	0.61	NS
Independence	34.71	33.86	0.46	NS
Grade 6	ME (47)	SVE (69)		
Security	78.70	71.08	3.40	.001
Consistency	45.76	30.83	4.05	.001
Independence	27.29	31.47	3.04	.003

and independence as measured by the Institute of Child Study Security Test for both grade 4 and grade 6 classes. This difference is not shown for pupils in grade 5. However, an examination of the means for grade 5 pupils shows that the ME children achieved particularly low scores on the security measures rather than that pupils in the SVE school attained particularly high scores.

The effect of open space on pupils' security measures is reflected in the analysis of the June data. The comparison of mean scores for security measures for grade 4 children shows a substantial narrowing of differences between the two schools where a statistically significant difference remains only for consistency scores. The interpretation of consistency scores for the security test suggests good organizational skills and generally good work habits of children. The results would imply that children in open space improve upon their work habits during the course of the school year, however they still remain behind the overall level of work habits of children in traditional classrooms.

Failure to maintain a significant difference between means for security and independence for grade 4 pupils results from a slight drop in scores for the ME school combined with a slight increase in scores for pupils at the SVE school.[1]

The mean for security established by grade 4 pupils in January at the ME school (60th percentile according to norms based on 1200 cases) shows a drop to the 50th percentile in June. While a difference is still maintained between grade 4 pupils at the ME and SVE schools, the effect of classroom structures is unclear as shown by these data.

Grade 5 pupils show no apparent trends in their security measures as an effect of open space or traditional classroom learning. While some changes in means are noted, no differences emerge which achieve statistical significance.

The baseline data for security, consistency and independence (January data) for grade 6 show the children in traditional classrooms to be well ahead of children attending the open space classrooms. Moreover, this difference in favour of children in traditional classrooms is maintained even five months later. While some improvement in the three security measures is shown for grade 6 pupils attending open space classrooms between January and June, grade 6 pupils in traditional classrooms continue to do significantly better when compared in January, 1972 and June 1972. These results provide some support to the hypothesis stated

1. It may be noted that the numerical score for independence is derived from the summation of rank position shown for all fifteen situations, hence a lower numerical score reflects a higher preference for independence.

by Anderson (1970) who proposes that while open space areas are desirable for primary grades, closed classrooms are more preferable for pupils at the upper grade school levels.

As part of another study, security test scores were available for the grade 6 pupils while they were attending grade 5 in June, 1971. While the composition of the grade 5 classes (1971) varies somewhat from the grade 6 classes (1972) in both schools, the two groups have for the most part the same children. The June, 1971 results for the three security test scores reveal a pattern very similar to that shown in June, 1972. The security test scores comparing the June, 1971 and June, 1972 results are shown below:

	June, 1971		June, 1972	
	ME (54)	SVE (66)	ME (47)	SVE (69)
Security	72.42	66.83	78.70	71.08
Consistency	37.19	28.27	45.76	30.83
Independence	31.16	34.35	27.29	31.47

According to the security development of pupils attending the SVE school, the results indicate that these pupils are about one year behind pupils at the ME school. Whether this result reflects the nature and quality of the educational experience for these children or may be attributed to other factors not examined in this study is unknown.

Since less than a third of the grade 6 pupils attending the SVE school live in the town and better than two thirds are bussed to school from farm and neighboring areas in the country, a statistical comparison was carried out between the rural vs. town grade 6 pupils at SVE.[1] The results of this comparison show a remarkable similarity between the children who reside in town or who reside on farms and neighboring areas to town. Mean scores for all security measures are almost identical. A significant difference between means showed no differences in security development for the two groups. T-test scores were all statistically above the .500 level of significance except for dependence on adults ($t = 1.44$; sign. at .155).

The difficulty to account for baseline differences for the grade 6 children must not be confused with the effect of traditional and open space classroom instruction received by the children. The findings of this study indicate that children who receive their instruction in open space classrooms do not fare any better or worse than children in traditional classrooms according

1. Almost all grade 6 pupils attending the ME school live in the town of Meaford and walk to school.

to the security measures employed. During the five month interval, January to June, neither the ME nor SVE schools showed any substantial change in security measures which could be attributed to the classroom situation. The improvement of grade 4 children in open space classrooms reported earlier must be considered with caution since the baseline level of these children was quite low. In general, the findings have identified substantial differences in composition for the two groups of children attending the ME and SVE schools, however an inspection of means obtained for security, consistency and independence between January and June for children in traditional and open space classrooms does not show any direct effects which could be attributable to the classroom environment during that period of time.

The effect of open space and traditional classroom instruction on teacher awareness of children's performance and behavioral characteristics was measured by comparing the June results on teacher awareness to baseline scores as shown in January. Table 4 shows the teacher awareness scores for each teacher separately as obtained for the January and June ratings. The teachers from the open space and traditional classrooms are grouped separately.

Table 4 (a)

Teacher awareness scores obtained for teachers in Grades 4 to 6 in open space and traditional classrooms during January, 1972 and June, 1972:

OPEN SPACE CLASSROOMS	N	Teacher Code	January 1972	June 1972
Grade 4	(27)	110	0	9
Grade 4	(25)	120	39	83
Grade 4	(26)	130	12	38
Grade 5	(33)	140	2	59
Grade 5	(31)	150	17	14
Grade 5	(33)	160	34	56
Grade 6	(35)	170	35	66
Grade 6	(34)	180	15	36
Means	(30.5)		19.2	45.1

TRADITIONAL CLASSROOM STRUCTURES	N	Teacher Code	January 1972	June 1972
Grade 3 & 4	(25)	210	9	28
Grade 4	(28)	220	43	59
Grade 5	(32)	230	11	17
Grade 5 & 6	(29)	240	2	6
Grade 6	(33)	250	13	55
Means	(29.4)		15.6	33.0

Table 4 (b)

Teacher awareness scores for Grade 7 teachers in traditional classrooms during January, 1972 and June, 1972:

	N	Teacher Code	January 1972	June 1972	
Grade 7 (1)	(24)	340	9	45	HR*
		350	11	34	
		360	1	37	
		380	2	6	
Grade 7 (2)	(27)	330	1	4	
		360	15	4	
		370	21	4	HR
		380	22	30	
Grade 7 (3)	(30)	310	1	3	
		340	1	10	
		350	3	3	HR
		360	0	9	
		380	5	12	
Grade 7 (4)	(29)	320	14	36	
		330	4	28	
		360	2	15	HR
		370	13	27	
		380	2	4	
Means	(27.5)		7.1	17.3	
Means - HR			8.8	16.8	

*HR - Home room teachers.

Comparing the mean teacher awareness scores for the SVE and ME schools based on the January teachers' ratings of pupils show a slightly higher baseline for teachers in open space classrooms, i.e. 19.2 to 15.6. It is noted that the mean number of pupils per classroom is also slightly higher in the SVE school, i.e. 30.5 to 29.4. Using the teacher awareness scores at face value, it would appear that differences in baseline indicate that teachers in open space schools get to know their children sooner than teachers working in traditional classrooms. Since the number of teachers involved in this analysis does not permit statistical treatment, the size of difference is difficult to interpret. However, by inspection, it is noted that five teachers in the SVE school obtain a teacher awareness score greater than the second highest teacher in the ME school.

In the year prior to this study, the teachers at the ME and SVE schools were involved in teachers' ratings of pupils as part of an inservice development program. The teachers at the SVE school were requested to rate all children with whom they had classroom contact, and accordingly the grades 4 and 6 teachers rated three classes, while the grade 5 teachers each rated two classes. The teachers completed the ratings twice, once in January, 1971 and again in June, 1971. Five of the eight teachers at SVE who completed the ratings in 1971 are also included in the current study. Four of the five teachers at ME who completed the ratings in 1971 are included in the present study.

The mean teacher awareness scores obtained for the five teachers at the ME school during January, 1971 and June, 1971 were 10.4 and 27.2 respectively. The eight teachers at the SVE school obtained mean teacher awareness scores of 14.6 and 22.4 when calculated on the basis of home room classes only, and 11.0 and 21.4 when based on each teacher's ratings of two or three classrooms with which the teacher had contact.

The mean scores for teacher awareness in the present study are considerably higher than those obtained in 1971 which may partly reflect improvement based on previous experience. It should be also noted that feedback of teacher ratings and awareness scores was provided to teachers individually, on both occasions in 1971 and 1972 following the January testing and rating sessions. The increase in mean teacher awareness scores for January, 1971 and 1972 for both schools is roughly five points, i.e. 10.4 to 15.6 (ME) and 14.6 to 19.2 (SVE).

Teacher awareness scores were also obtained in other studies by Grapko (1969) and Grapko and Fraser (1970, 1971). In all cases, the teacher ratings were completed only once each year. In 1970, thirty-four teachers from Grades 4 to 6 in the Kenora Board of Education participated in the study. In 1971, forty-four teachers were included representing all teachers from grades 4 to 7. Twenty-five teachers participated in both Kenora Studies in 1970 and 1971.

The mean teacher rating scores in the Kenora Study in 1970 and 1971 were 21.7 and 22.2 respectively based on data collected at the end of December in each year. The mean teacher rating scores for the twenty-five teachers involved in both the 1970 and 1971 studies were 23.0 (1970) and 21.9 (1971). However, it should be noted that almost all teachers had a different group of children in each of the two years. Average class size was identical in both years, namely 28.2 pupils per class. Ten schools were included in the 1970 study and eleven schools in the 1971 study. All schools in the Kenora Board have traditional classrooms. In view of these data, it would appear that the teachers in the ME school start at a lower baseline according to teacher awareness scores than what is shown either for the SVE school or the schools used in the Kenora Study.

The teacher awareness scores obtained by both groups of teachers in the ME and SVE schools in June show a clear advantage to teachers in the open space classrooms, although it is noted that substantial increase in scores is obtained by both groups. Clearly these results indicate that teachers rate children more closely to children's own self description on a personality test at the end of the school year than they do half-way through the year. It is not

clear whether the substantial increase in mean teacher awareness scores for both schools results from an increase in knowledge about the children due to a longer period of contact between teacher and pupil, or results from the feedback which was provided to teachers about their January results.[1]

In any case, the results provide some evidence in support of the assumption that open space classrooms provide teachers with as good as, if not better, an opportunity to get to know the pupils in their classes. Referring to the 1971 data where teachers in open classrooms rated two or three classes with whom they had contact, the mean teacher rating scores increased from 11.0 in January, 1971 to 21.4 in June, 1971. Teachers in traditional classrooms obtained mean teacher rating scores of 10.4 in January, 1971 and 27.2 in June, 1971 where only one classroom of children were rated. It should be noted that the SVE program in 1971 was arranged that no teacher had a regular classroom, nor were children grouped into a stable classroom structure. In 1972, the arrangements were changed to permit each teacher to identify with a particular classroom which continued to the end of December. In the second half of the year more provision for rotary and team teaching was introduced where one teacher taught classes to all children in a particular subject at a given grade level. It would seem from the data that while open space classrooms fare equally at least to traditional classrooms in respect to teacher awareness scores, teachers do better if they have the opportunity to work with only one classroom of children at least for the first half of the year.

The teacher awareness scores obtained for grade 7 pupils is shown in Table 4 (b). Since the grade 7 pupils are on a complete rotary system, the lower mean teacher awareness scores may result for the same reason as described for the SVE school in 1971. These results may also suggest that the phenomenon of awareness is reduced with an increase of age in the pupils who are to be rated. This notion, however, is less tenable when applied against the grade seven classes included in the Kenora Study, 1971. The mean teacher rating scores based on eleven grade 7 classrooms was 33.4. However, each teacher was requested to rate only the home room class. The three Kenora schools involved which include the grade 7 classes operate on a somewhat reduced rotary system and it would appear that the teacher has a greater sense of identification with the home room. All schools have traditional classroom structures. Two of the three schools referred to in this analysis are primarily

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1. This question is currently being researched in a third Kenora study (Grapko and Hay) where only half of the teacher sample received feedback regarding their ratings in January, and half received no feedback at all. A total of fifty teachers participated in completing pupil ratings in January and June, 1973.

senior public schools, i.e. contain only grade 7 and 8 classes.

While ME is a K to 8 school, it should be noted that about two-thirds of the grade 7 pupils come from the SVE school and are completely new to the school, the program and the teachers. In addition, better than two-thirds of these children live outside of town and are likely to have no community contact with the teachers who for most part reside in town. Almost all grade 7 pupils in the Kenora schools reside in the town and many are known to the teachers through community contacts.

Two further points are noted. Five of the eleven Kenora teachers were completing teacher ratings on pupils for the second time whereas none of the eight ME teachers participated in ratings previously. Secondly, the time devoted to ratings was almost inclusively confined to school time at the ME school whereas the Kenora teachers completed the ratings at home. Provision was made to secure a supply teacher for the period during which the ME teachers completed their ratings which, in most instances, required two class periods with some carry over to the teachers spare period. Since six of the eight ME teachers had two or more classes to rate, it may be a factor in accounting for the initial low baseline for mean teacher awareness scores.

Using all thirteen teachers in the 4 to 6 grade range in both the SVE and ME schools, a rank order coefficient was obtained to assess the stability of teacher awareness scores based on the same group of children. The correlation was .67 (significant at .01)[1]. This result would suggest that teacher awareness is relatively stable as a phenomenon when assessed in a six-month to one year period. It should be added, however, that while the rank position of the teachers remains stable, all teachers except one showed substantial increase in their teacher awareness score during the second rating session.

The effect of open space and traditional classroom structures on children's academic performance is restricted to the results of the Canadian Test of Basic Skills (CTBS) which was administered only once in 1972 to all grade 6 pupils in the ME and SVE schools. The CTBS was administered to all grade 6

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1. A rank order correlation based on twenty-five teachers in the Kenora study who rated different groups of children in 1970 and in 1971 obtained a coefficient of .30 (NS). However, based on twenty-three teachers, the coefficient was .47 (significant at .05). Two of the teachers in this group showed high instability, oddly enough in reverse directions. Sixteen of the twenty-five teachers varied 7 or less points in their two rank positions, ten teachers varied less than five in the two rank positions, and seven teachers were identical in their rank or differed by only one.

classes in the Grey County Board of Education and these data were made available for purpose of the present study. Table 5 shows the means and rank position of the grade 6 pupils for four scores on the CTBS for the ME and SVE schools. The mean score for all grade 6 pupils in the county is also shown.

Table 5

Mean and rank position of Grade 6 pupils on the CTBS for ME and SVE schools:

Means	N	Vocabulary	Reading Comprehension	Mathematics Concepts	Mathematics Problem Solving
ME	47	25.6	42.9	25.1	16.1
SVE	66	22.2	36.0	22.7	13.8
County		24.6	39.0	24.0	14.5
Rank Position (out of 20 schools)					
ME		7	3	8	5
SVE		18	18	13	13

These results show that grade 6 pupils attending the traditional classroom school achieve better scores on all four sub-tests on the CTBS than grade 6 pupils attending open space classrooms. It should be noted that the SVE school opened in 1970 and the present results are based on pupils' performance who, for the most part, were in their third year of attendance in open space classrooms. However, the grade 6 pupils attending SVE were administered the CTBS for the first time in 1972 whereas the CTBS is administered annually to pupils at the ME school commencing at grade 3. The CTBS was given to all grade 6 pupils in the County for the first time in 1972. Whether the repeat effect accounts for some of the discrepancy in scores between the ME and SVE schools is unclear, however the rank position for pupils at SVE would place the pupils in the bottom third on scores obtained in the County. These findings are similar to the results obtained for security, consistency and independence scores (see Table 3) where the grade 6 pupils in open space classrooms showed significantly lower scores. Since no baseline data are available, it is difficult to assess what the starting point may have been for pupils in open space a year ago in relation to the scores which are shown in Table 5.[1]

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1. A study for which funding was received from Grant-in-Aid for Educational Research and Development from the Ministry of Education, Ontario in July, 1973 will compare grade 7 and 8 pupils attending the ME school, half of whom had previous schooling in open space classrooms and half who had all their schooling in traditional classrooms according to academic performance, school motivation and independence development.

The significance of differences between means between the ME and SVE schools was determined for I.Q. and each of the four subtests on the CTBS. The results of the t-test analysis show no statistically significant difference for I.Q. ($t = 0.72$), vocabulary ($t = 1.46$), or mathematics concepts ($t = 0.46$).[1] Statistically significant differences were found for reading comprehension ($t = 2.55$; sign. at .013) and mathematics problem solving ($t = 2.34$; sign. at .021).

The mean I.Q. scores obtained from school records for grade 6 pupils attending the ME and SVE schools are shown as 105.0 and 103.2 respectively. Standard deviations for I.Q. scores are 13.9 and 13.9. The mean correlation of I.Q. scores with the subtest scores on the CTBS show to be slightly higher for pupils in open space classrooms for both language (vocabulary and reading comprehension) and mathematics skills (mathematics concepts and mathematics problem solving). The coefficients for the ME and SVE schools for the language subtests are .69 and .78 and for math skills the coefficients are .57 and .70 respectively (see Table 6). While all coefficients are statistically significant relating I.Q. to academic performance, I.Q. appears to be associated with more of the variance in estimating performance for pupils in the open space classroom. This result may be interpreted to mean that intelligence is more important in establishing performance levels of pupils in open space classrooms than it is for pupils in traditional classrooms. Correspondingly, there may be a tendency that greater benefit is likely to accrue to bright students in open space classrooms than to pupils who are lower in intelligence.

Table 6

Correlations obtained for I.Q. and four subtests on the CTBS for two grade 6 classes attending the ME and SVE schools:

ME School	N	Vocabulary	Reading Comprehension	Mathematics Concepts	Mathematics Problem Solving
Grade 5 & 6	26	.71	.65	.48	.43
Grade 6	32	.63	.78	.67	.69
SVE School					
Grade 6	32	.72	.82	.59	.66
Grade 6	26	.78	.81	.87	.69

Using the grade 6 classes only, the top twenty pupils ranked by I.Q. were selected from the ME and SVE schools and compared for differences in I.Q. level and for performance on the four subtests of the CTBS. The results of

1. Burnham (1971) compared I.Q. and achievement test scores between open space and traditional schools for grade 1 children and found no significant differences.

this t-test analysis show no statistically significant difference for any of the five variables. Accordingly, bright students appear to do equally well whether they receive their instruction in open space or traditional classrooms.

A comparison of the bottom twenty pupils ranked by I.Q. from each of the two schools shows somewhat different results. While no significant difference between means between the two groups of pupils is shown for I.Q., vocabulary or mathematics concepts, highly significant differences are reported for reading comprehension ($t = 2.84$; sign. at .008) and mathematics problem solving ($t = 3.85$; sign. at .001). It would seem that differences in performance on the CTBS between the ME and SVE schools reported earlier are accounted for by the difference in performance of low I.Q. pupils. It would also appear from these results that low I.Q. pupils are likely to achieve less if they receive their instruction in open space classrooms than in traditional classrooms.

It may be difficult to interpret this finding. It is possible that open space is unmanageable for children in the lower I.Q. range and they are more vulnerable to the distractions of noise, movement and activities. It is possible that the freedom to choose activities and schedule one's own program is either hazardous or premature for these children and they are unable to provide their own structure in formulating and sustaining a productive learning experience. It is particularly interesting that the performance deficits shown by lower I.Q. children in an open space school have to do with understanding, either in what they read or in solving mathematical problems. Teachers in traditional classrooms are more likely to provide the structure and check-off system which is needed to assure that the child "understands".

A second explanation of these results may have to do with the nature of objectives formulated for open space education. The emphasis on independent study (MacDonald, 1969), the stress on pupil initiative, responsibility, inquiry (Burnham, 1970) and the use of the discovery method combined with programs of self-development and self-discipline (Wilson, Langevin and Stuckey, 1969) may be designed to fit the bright child and cause serious obstacles to children in the lower I.Q. range.

Durlak, Lehman and McClain (1973) in a recent survey of children's attitudes to open space and traditional schools show that children are divided on their opinions about a large number of features associated with both open space and traditional schools. For children attending open space schools, about 42% of them express their satisfaction with the appearance of an open space school, however, 16% are dissatisfied. Only 28% of children report to have their own work

place in open space schools whereas 55% say that it is important to have one's own work place. It may be necessary to look more carefully at factors that contribute to differences in attitudes and opinions among children. It may well be that certain groups of children for reasons of I.Q. or some other variables are less eligible to benefit from the objectives of an open space program or an innovative school design.

A third explanation for these data may be related to teacher preparation and teaching strategies. Durlek, Lehman and McClain (1973) in preparing a set of recommendations in aid of open space schools state that the most important recommendation is the need for extensive continuous training programs for teachers who now work in open program and flexible space schools. The demands on teachers who work in open space classrooms have been well documented (Brunetti, Cohen, Meyer and Molnar, 1972; Warner, 1971; Durlak, Lehman and McClain, 1973; Beardsley and Murray, 1973). The need by teachers and school personnel to provide startling results and give evidence of viability to open space instruction may have in fact designed learning programs and created opportunities that are more suitable to higher I.Q. children, and that programs and opportunities for lower I.Q. children are still to be developed. Most of the innovations in education have generally followed this pattern where the validity of a new idea, program or design has been tested on the brighter youngsters in the school system. It is usually some time later that the effect of new programs are evaluated against the behavior and performance of lower I.Q. children.

A comparison of I.Q. and four subtest scores on the CTBS for the grade 6 pupils at SVE who lived in town or on farms and neighboring areas to town showed no differences whatever. While the t-test values were not statistically significant, it may be interesting to report that the larger means for all five variables favored the children who reside on farms and smaller villages. However, there were only sixteen pupils included in these comparisons who lived in town. Perhaps the one and two room school houses were not an educational disaster after all.

The I.Q. score was also correlated with scores for security, consistency and independence as well as the total pupil rating score. The results of this analysis are shown in Table 7 and are based on each grade 6 class separately.

Table 7

Correlation between I.Q. and security, consistency, independence and teacher ratings for each of two grade six classes in open space and traditional classrooms:

Open space classrooms - factors correlated with I.Q.

	N	Security	Consistency	Independence	Teacher rating
Grade 6	32	.62**	.68**	.59**	.76**
Grade 6	26	.45*	.54**	.49**	.73**
Traditional classrooms					
Grade 5 & 6	26	.09	.04	.02	.71**
Grade 6	32	.25	.29	.26	.70**

* significant at .05
** significant at .01

These results show a significant relationship between I.Q. and security measures and teacher ratings for the two grade 6 classes in the open space classrooms, however no such relationship exists between I.Q. and security measures for grade 6 classes in the traditional classrooms. Recognizing some limitations on these findings due to the small number of classrooms available for this analysis, the impact of I.Q. on academic performance reported above for pupils in open space schools may also extend to provide greater growth opportunities in developing security, consistency and independence. The relation of I.Q. to teacher assessments of pupils seems to obtain in both classroom settings.

Brunetti, Cohen, Meyer and Molner (1972) report some data which show children to be much more active and have greater autonomy when attending open space schools. The present data would tend to suggest that the possible benefits of such activity and autonomy are more likely to occur particularly to bright children. The significant correlation of I.Q. with indpendence in open space classrooms would imply that bright children given an open space setting to work in can and do exploit to their advantage the opportunities for greater mobility and flexibility available by open space. It would appear that traditional classrooms are more likely to keep I.Q. in check, possibly restraining very bright children to keep pace with classroom schedules and activities.

Brunetti et al from their observations suggest that the most important educational consequences of the open space school may have to do less with the child's cognitive learning than with the change in his status in the school. The present study suggests that brightness may be an important factor in determining the advantages the child receives from schooling in open space classrooms both in

terms of academic progress and particularly in the development of independence and positive feelings that a child develops about himself. The relationships between I.Q. and consistency scores suggests that brightness may be a factor in promoting good work habits and organizational skills for children who work in open space classrooms.

Failure to show any relationship between I.Q. and security variables for pupils in traditional classrooms suggests that the difference in climate which is created in open space and traditional classrooms may be much more significant than what may be expected. If I.Q. and security relates in open space classrooms and does not in traditional classrooms it would appear that two different sets of behaviors in children are being reinforced and encouraged. In open space classrooms it may be that confidence and self-esteem are awarded to the child who shows initiative, makes his own decisions, is well organized and achieves, whereas in traditional classrooms the child's feelings about himself may be derived from behaviors which require good attention, ability to profit from instruction and direction, to show progress, control body impulses, abide by routine and work without disturbing others.

Moreover, it seems that open space links I.Q. and achievement and security feelings whereas traditional classrooms link only I.Q. and achievement. It is of some interest to note that the correlations between I.Q. and the four subtests on the CTBS for the four grade seven classes at the ME school show no significant relationship between I.Q. and achievement for three of the four classes.[1] The relationship of achievement, security, school motivation and I.Q. will be studied more intensely for grade 7 and 8 pupils, in terms of previous open space and traditional school instruction, next year.

The existence of a strong relationship between I.Q. and teacher's ratings of pupils has been shown in numerous studies. The results obtained in this study simply concur with these findings. Again, surprisingly, only two of the four grade seven teachers show a relationship between I.Q. and their rating of the pupils in the home room class. It would seem, however, that bright children have a decided advantage in school programs whether conducted in open space or traditional classrooms since the objectives of the program are more likely to be achieved by the higher I.Q. pupils. Moreover, where the school objectives deviate from achievement criteria, such as establishing good work hab. ;, showing interest or paying attention in class, the higher I.Q. child is likely to see and experience

1. Only one grade 7 class showed a significant relationship between I.Q. and security measures.

a greater payoff from fulfilling these objectives as well. Hence, for a number of reasons, teachers are likely to perceive brighter children in a more favorable light and the data of this study confirm this assumption whether the pupils attend open space or traditional schools.

D. Summary and Conclusions

This study has been concerned with exploring certain differences which may exist for children and teachers who pursue their education or work in an open space or traditional school. Two schools were selected for this study that resembled each other in a number of variables in order to minimize the possible effects that could result from socioeconomic differences, racial or ethnic differences, mobility of families or length of membership in the community. The population of children in this study is reasonably homogeneous and except for children who reside in the neighboring areas adjacent to the town, the two groups of children attending the open space or traditional school are remarkably similar. Moreover, since only two elementary schools exist in this town, the study has included all children in grades 4-7 who attend school in this area.

Four main types of data were collected in this study. The Institute of Child Study Security Test - Elementary Form, called The Story of Jimmy, was administered to all the children in the study on two occasions, in January, 1972 and June, 1973. The principal and/or vice-principal administered the test on both occasions in each school. Conditions during the two test sessions were nearly identical as to place, time of day, and size of group.

The second source of data came from the teacher ratings of pupils. The teacher rating questionnaire had been used in previous studies and was reasonably free of ambiguities and confusion. A preliminary session was held with the staff of each school in order to outline the study, solicit teacher interest, and clarify any questions. Each teacher was provided with time during the school day to complete the rating questionnaire, once in January, 1972 and again in June, 1972. During the month of March, each teacher met individually for an hour or so with the principal investigator to discuss the results of the January administration of the security test and the teacher rating questionnaire. A correlation matrix was prepared to establish amount and nature of teacher agreement with the pupils' self description and was used as a measure of teacher awareness.

The scores on four subtests of the Canadian Test of Basic Skills was used as a third source of data. These tests were administered by the principals of each school and formed a part of a testing program initiated by the County Board

of Education. This test was administered to all grade 6 pupils in all elementary schools in the County.

Finally, the I.Q. scores were obtained for each child from school records. Children who had no I.Q. score reported were omitted from the analysis of the data which included this variable.

A total of 501 pupils were included in the study, 257 children attended the ME school (traditional structure) and 244 children attended the SVE school (open space structure). Girls and boys were almost equally represented with 248 girls and 253 boys. Only pupils attending grades 4 to 6 were used in the SVE school, and pupils in grades 4 to 7 were included from the ME school.

All data collected in the study were punched on cards and all results reported in the study were processed by computer at the University of Toronto. Teacher awareness scores were based on coefficients significant at the .05 level or better. In most cases, the level of significance of correlation coefficients or t-scores is reported with the results. Obviously the restraints on the study do not permit the inclusion of a large amount of data analysis which was completed. Tables which are shown in the study deal with the central issues and have been abbreviated as much as possible to spare the reader. Only three of the seven security scores are included in the study. The sixteen traits which make up the teacher rating questionnaire are used as a collective score only. Any attempt to examine each trait separately would exceed the limits for this study. Much of the data available for the grade 7 pupils at the ME school was omitted from this report since no comparable grade level existed at the SVE school. The analysis of CTBS scores is mainly restricted to a comparison of grade 6 pupils at the SVE and ME schools. Only reliability scores for the security test are included.

The findings reported in this study attempt to locate fruitful areas for further research as much as to add new information to a relatively new domain of inquiry. Open space schools are here to stay for a long time. These schools have been built in almost all counties in this province and some Boards of Education have committed themselves to build open space schools exclusively in respect to all new construction. In many cases, traditional classrooms are being redesigned and revamped to provide for greater open space. In a sense, any research findings which may be unfavorable to open space education may be unpopular and poorly received. On the other hand, research findings which support the open space approach to education may be misconstrued to condone innovative practices in education which race ahead in the belief that evidence and truth will follow.

At the outset, it is important to establish the limits for generalization from the results which derive from this study on open space and traditional schools. Research which permits no limits for generalization is almost useless, on the other hand to assume that the present findings apply to all open space and traditional schools wherever they may be found in this province or elsewhere is a demonstration of unbridled enthusiasm and naivete.

The findings of this research are reported in the order in which they appear in the study:

1. While a general improvement in security, consistency and independence scores is shown for pupils in grades 4 to 6 attending open space and traditional classroom schools during a five month interval, the results indicate that each grade level in both schools shows a constancy or stability for each of the three security measures from January to June. The statistically significant improvement in consistency scores for grade 4 pupils in the open space school results from a particularly low mean score to start with (January baseline). This result reflects more adequately a catch up for grade 4 pupils in consistency scores in open space classrooms, rather than a substantial growth in organizational skills and work habits.

2. Stability coefficients obtained for security, consistency and independence scores for each grade in each school show scores for individual pupils to also remain reasonably constant over a five month period. These stability coefficients are very similar to the reliability coefficients reported, in the manual, and in the 1971 Meaford study (Grapko, 1957, 1971).

3. A comparison of security, consistency and independence scores for pupils attending an open space or traditional school shows pupils in a traditional school to do remarkably better at the grade 4 and 6 levels with no statistically significant difference apparent at the grade 5 level according to the data collected in January, 1972. The report of the Institute of Child Study Security Test, given in June, 1972, shows some catch up for grade 4 pupils in the open space school but grade 6 pupils in the traditional school continue to maintain an advantage in scores over grade 6 pupils in the open space school.

This result is contrary to some opinions expressed by advocates of open space schools. The belief that pupils in open space classrooms will increase in developing their feelings of self-confidence, work habits and desire to work independently is not supported by the findings of this study. An inspection of data collected in January and June, 1971 for grade 6 pupils in this study shows that pupils in open space classrooms were about one year behind pupils attending the traditional school according to the security measures.

4. Teachers working in open space classrooms show some slight advantage over teachers in traditional classrooms in their ability to rate pupils in accordance to children's self description on a personality test. This measure of teacher awareness continues to favor teachers in open space classrooms midway and at the end of the school year. While the proponents of open space describe new opportunities and responsibilities for teachers in open space classrooms, there has been no mention of the effect of open space in providing teachers a better opportunity to get to know their pupils. The evidence presented in this study show teachers in open space classrooms to report more accurately on children's behavior to what children report of themselves. In an earlier study (Grapko & Fraser, 1971) it was shown that high awareness teachers arranged for more informal learning situations, group project work and more opportunity for class participation whereas low awareness teachers subscribed to a more traditional approach to teaching with an emphasis on instruction through lesson presentation. It is reasonable to assume that teachers in open space classrooms may identify more readily with the first teaching style and hence partly explain the results shown in this study.

The results of this study also show that generally teachers on a rotary program (grade 7) report substantially lower teacher awareness scores than teachers at the grades 4 to 6 levels. However, since some grade 7 teachers do in fact do better than some grade 4 to 6 teachers, factors which may influence teacher awareness are not unequivocally tied to grade level alone.

5. The study of achievement and academic progress for children attending the open space or traditional school was confined to grade 6 pupils only. These results show that pupils in traditional classrooms do better academically. It was also found that these results were primarily due to the lower I.Q. children attending the open space school.

While no differences were noted on achievement between higher I.Q. children in either open space or traditional classrooms, the lower I.Q. children attending the open space school perform significantly below the lower I.Q. children in traditional classrooms. It would appear from this finding that lower I.Q. pupils need more direct instruction, more guidance and direction and have their progress monitored more carefully than what is usually available in an open space school. Conversely, it may mean that the opportunities for pupils at this grade level in an open space school are more confounding than helpful. It may also be that teachers in open space classrooms need to develop better approaches to dealing with the lower I.Q. child.

An interim research report by Bell and Switzer (1973) indicates that open space classrooms impair the reading skills of grade 1 and 2 children. They found that twice as many children in open space classes scored below the norms in reading tests than their counterparts in traditional classes. It was noted earlier that Burnham (1971) did not find any differences between I.Q. and achievement test scores for grade 1 children when compared for open space and traditional classrooms.

6. It appears that intelligence is associated with development in security, consistency and independence for grade 6 pupils in open space classrooms and this relationship does not obtain for pupils attending a traditional school. This result suggests that bright children attending an open space school work effectively within the concept of open space to augment their feelings of self confidence and independence and to promote good organization skills in the pursuit of their studies. From the last two findings, it looks as if the open space school has clear advantages for children who are bright. This result needs replication and if true has important implications for the selection and placement of pupils in various educational settings.

On the other hand, the advocates of the open space concept may have focused on bright children to prove a point. Wittingly or unwittingly, the innovation of physical space in education, or perhaps any educational innovation for that matter, searches to establish evidence in support of its ideas. The opportunity to report dramatic results usually exists in the dimension of excellence.[1] However, it is important to replicate this finding since the results may have some important implications.

The findings presented in this study should stimulate further research. Some of the results are important to future planning in education and deserve to be confirmed. It would seem that open space schools have some clear advantages and disadvantages. Indeed it is possible that these advantages and disadvantages are related to particular children, perhaps to particular teachers and perhaps to particular programs. The study does not rule out some advantages and disadvantages of traditional schools as well. The fact that the study presents some highly significant results identifies the variable of physical space as an important factor in the education of children.

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1. For example, the President of a large Canadian university annually reported with pride the number of Woodrow Wilson Scholarships received by its student body. By implication, the number of scholarships was evidence of proof of outstanding staff, effective teaching methods, good administration, effective library system and many ideas which were being promoted at that time.

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APPENDIX 1

INSTITUTE OF CHILD STUDY SECURITY TEST

ELEMENTARY FORM - THE STORY OF JIMMY

The test provides the following seven scores:

1. Security score - a composite score based on the order of preference for the five component measures for the fifteen situations in relation to the ideal order of preference. High secure children express feelings of self-confidence, have good self image and demonstrate a good approach to learning.

2. Consistency score - a composite score based on the similar order of rank assigned to each of the five component measures for the fifteen situations. Children with high consistency scores show good organizational skills, have good work habits and work effectively toward their objectives.

3. Independent security score (IS) - a component score based on the individual's preference for skilled, self-initiating, independent behavior. This child likes to work on his own.

4. Mature dependent security score (MDS) - a component score based on the individual's preference for mutually supporting social behaviors. The child sees strengths in his peer relationships and contributes to peer social effectiveness.

5. Immature dependent security score (IDS) - a component score based on the individual's preference for adult help-seeking behavior. The child looks for support and direction from adults or older peers.

6. Deputy agent score (DA) - a component score based on the individual's preference for defensive behavior. The child makes excuses for his shortcomings, and evades facing up to consequences of his actions. High scores indicate high moral development.

7. Insecurity score (INS) - a component score based on the individual's choice of anxiety behavior. These children are usually unable to decide any course of action for themselves.

INSTITUTE OF CHILD STUDY SECURITY TEST

Elementary Form

The Story of Jimmy

DEFINITIONS OF TERMS

The test provides the following seven scores:

Security Score: A composite score based on the order of rank preference for the five component measures for the fifteen situations in relation to the ideal rank order represented in security theory. The score indicates the child's preference for an independent approach to problem solving reflecting a confidence in his own abilities and a willingness to accept the consequences for his actions. Low scores indicate indecision and hesitation to act resulting from a lack of confidence in self.

Consistency Score: A composite score showing the overall consistency of rank designation for each of the five components in each of the fifteen situations. The score is determined according to Kendall's coefficient of concordance. Scores indicate self vs. situational determination of the child's actions. Low scores suggest the weather vane which responds wholly to external forces, while high scores show a prevailing life style reflecting good organizational skills and self determination.

The five component scores are derived from the summation of each rank designation given to each of the components for the fifteen situations. If one of the components received a rank of 1 in ten situations and a rank of 2 in the remaining five situations the score for that component would be (1 x 10) + (2 x 5) = 20. These scores are entered in the X column of the score sheet and may range from 15 to 75.

Independent Security (IS): This component measures the child's preference for independent action based on his perception that he possesses the necessary skill or knowledge and has confidence in his ability to initiate and complete a task successfully according to his expectation level.

Mature Dependent Security (MDS): This component measures the child's preference for peer collaboration where the situation permits mutual involvement and participation. The child perceives the situation and/or goal as one that can be shared with others and has confidence in the contribution that can be made by others and himself.

Immature Dependent Security (IDS): This component measures the child's dependence on adults for help and/or reassurance. Preference for adult intervention may suggest the need for help and direction for the child who lacks the skill and ability or may be solicited to provide support and reassurance from the adult where the child is unprepared to judge on the adequacy of his own performance or behaviour.

Deputy Agent (DA): This component measures the tendency of the child to evade, postpone or excuse himself from assuming responsibility for a certain action or situation. These mechanisms include blaming others, rationalizations, contriving excuses and avoidance behaviours. The child who delegates the DA items to the last rank position in most situations reflects high moral or conscience development.

Insecurity (INS): This component is a measure of pervading anxiety expressing a lack of confidence in one's ability and feelings of immobilization. The child who endorses this component expresses an uncertainty of action accompanied by the decision to sit, wait, and hope the situation will pass.

ABRIDGED

APPENDIX 2

TEACHERS' RATING QUESTIONNAIRE

The following is a list of the traits rated. This rating questionnaire was designed to assess the position of each child in the class on a five-point distribution for sixteen different traits or aspects of behavior.

1. Discipline: Displays behavior that you, the teacher, consider appropriate for your classroom.

2. Ability to Get Along: Interacts with most of his classmates in a satisfactory manner.

3. Acceptance of Goals: Contributes to classroom activities, i.e., answers questions readily, talks during discussion, makes active contribution to class projects.

4. General Adjustment Evaluation: Considering all aspects of the child's adjustment to the classroom environment, evaluate his position.

5. Reading: Reads with comprehension and fluency; conveys meaning to listeners.

6. Mathematical Ability: Shows understanding of mathematical concepts and operations; can solve problems.

7. Language: Extent of vocabulary; correct grammatical usage of English; ability to express self clearly. (Both oral and written)

8. Use of Out-of-School Experiences in Class: Draws on background experiences, reading.

9. General Performance Level: The quality of work; diligence in performing it.

10. School Ability: To provide your estimate of this child's ability, try to predict how far you think he will go (ignore financial ability of parents).

11. Faces Up to Things: Owes up to his actions; willing to accept the consequences for his actions, good or bad.

12. Makes Up His Mind: Shows ability to organize his ideas quickly and to make a decision.

13. Attitude to Learning: Shows an interest and ability to learn; enthusiastic about learning new materials.

14. Sure of Himself: Shows a confidence in himself combined with a capacity to do things.

15. General Adjustment: Ability to cope with all aspects of school life; generally happy disposition.

16. Overall Feelings of Security: Displays general feelings of security about himself and his relations with others.